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Lahaina Energy Partnership: Technical Assistance Task Updates and Discussion Part 2

Presented to the Lahaina Community

By the National Laboratory of the Rockies (NLR) with Local Partners Lāhainā Strong, Hā Sustainability, and Shake Energy Collaborative

Robin Burton, Amanda Farthing, Edward Baring-Gould, Jordan Burns, Maya Fein-Cole, Bryan Palmintier, Manasa Muralidharan, Lawryn Kiboma, and Taylor Curtis

Dec. 11, 2025, 5:30–7:30 p.m.; optional talk story 7:30–7:45 p.m.

This presentation was produced when the laboratory operated as the National Renewable Energy Laboratory (NREL). The laboratory is now the National Laboratory of the Rockies (NLR).

Workshop Series Schedule, Objectives, & Agenda

Workshop Series Schedule

- **Workshop 1:** November 18, 2025, 5:30-7:45 pm. Topics: Hydropower resource potential, building energy modeling, workforce development
- **Workshop 2:** December 11, 2025, 5:30-7:45 pm. Topics: Microgrids, electric grid hardening, policy and regulatory analysis

Objectives

- Share updates by topic on technical assistance in progress
- Request community input to guide next steps.

Agenda

- Welcome and agenda (5 min)
- Project overview, timeline, technical assistance (TA) overview, and general Q&A (10 min)
- NLR TA updates and Q&A with NLR task leaders
    - Microgrids (25 min)
    - Distribution grid and undergrounding (25 min)
    - Policy and regulatory analysis (20 min).
- NLR TA small group discussions and Q&A (30 min)
- Next steps and adjourn (5 min)
- **Optional:** Talk story with task leads in breakout rooms (15 min).

Project Overview

Photo by Robin Burton, NLR

Lahaina Energy Partnership

PROJECT OVERVIEW

The U.S. Department of Energy (DOE) and NLR initiated a multiyear, community-led project for Lahaina to:

1. **Identify energy questions** related to rebuilding Lahaina.
2. **Conduct technical analysis** to support informed, community-led decision-making.

Community Role:

Local partners convene the Lahaina community to identify energy solutions of interest and inform a scope of TA.

National Lab Role:

National labs conduct analysis to assist the Lahaina community in assessing opportunities for energy planning and rebuilding.

Learn more (click or scan):

Lahaina Energy Partnership Local Partners

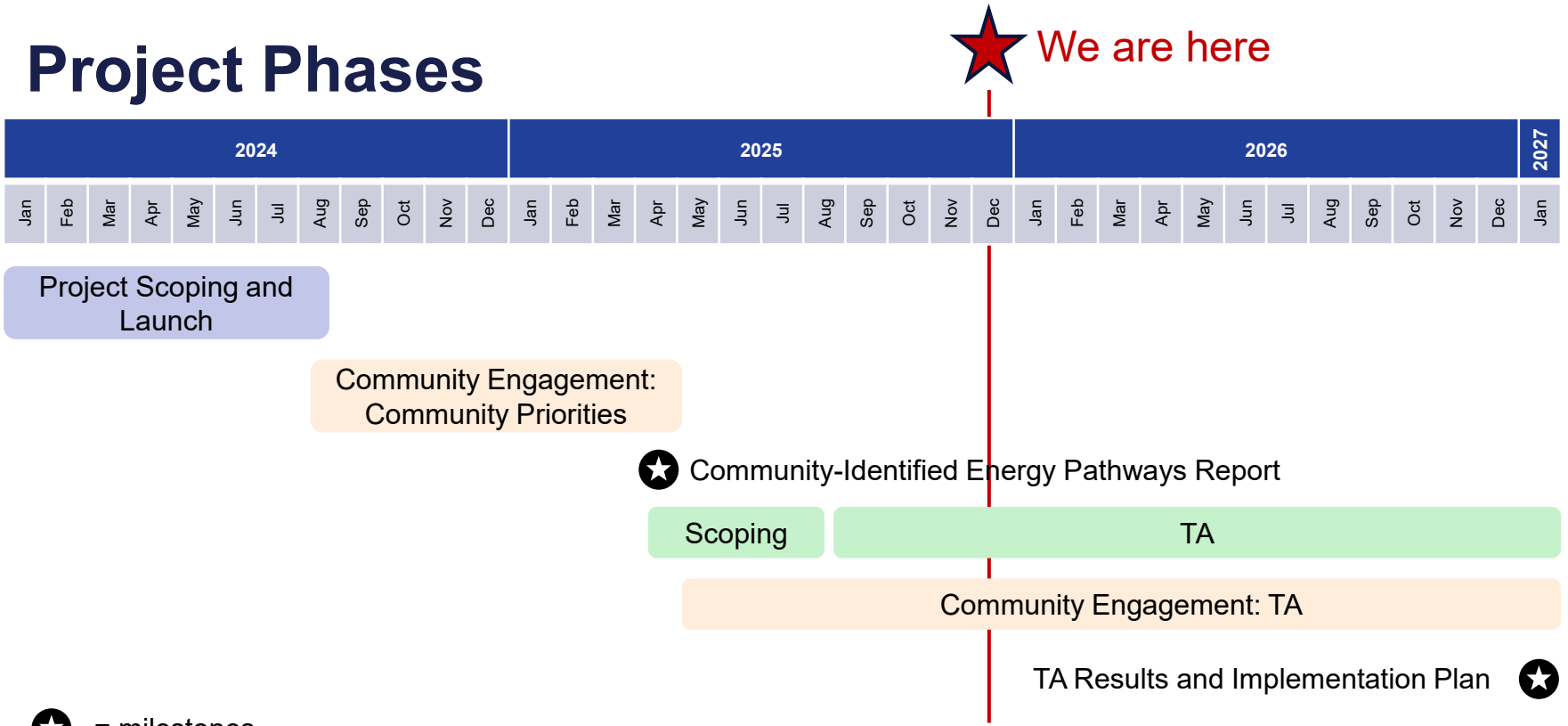
LĀHAINĀ STRONG

Hā Sustainability
Empower. Innovate. Thrive.

SHAKE ENERGY COLLABORATIVE
Community-designed renewable energy

Photo caption: Hawaiian Electric-hosted site visit with the Lahaina Energy Partnership, Māʻalaea Generating Station, Maui. *Photo from Hā Sustainability.*

Project Phases



COMMUNITY TA PRIORITIES

- Low-Impact Hydropower
- Community Energy Microgrids
- Undergrounding and Other Grid Hardening
- Distributed Energy Resources
- Community Solar (aka Shared Solar or CBRE)
- Community Ownership Models for Energy System Infrastructure
- Workforce Development and Job Training
- Grid Modernization, Grid-Interactive Technologies, and Demand Response
- Waste-to-Energy
- Agrivoltaics

NLR TA TASKS

- **Task 1.** Resource Assessment
- **Task 2.** Building Modeling
- **Task 3.** Microgrids
- **Task 4.** Distribution Grid/ Undergrounding
- **Task 5.** Crosscutting Topics
  - Subtask 5.1 — Workforce Development
  - Subtask 5.2 — Policy and Regulatory
  - Subtask 5.3 — Funding and Financing

General Q&A

What questions or comments do you have on the project overall?

NLR Technical Assistance Updates and Q&A by Task

Presented by NLR Task Leads

Task 3. Microgrids

Presented by Amanda Farthing, Ian Baring-Gould, Jordan Burns, and Maya Fein-Cole, NLR

Photo by Robin Burton, NLR

What Is a Microgrid?

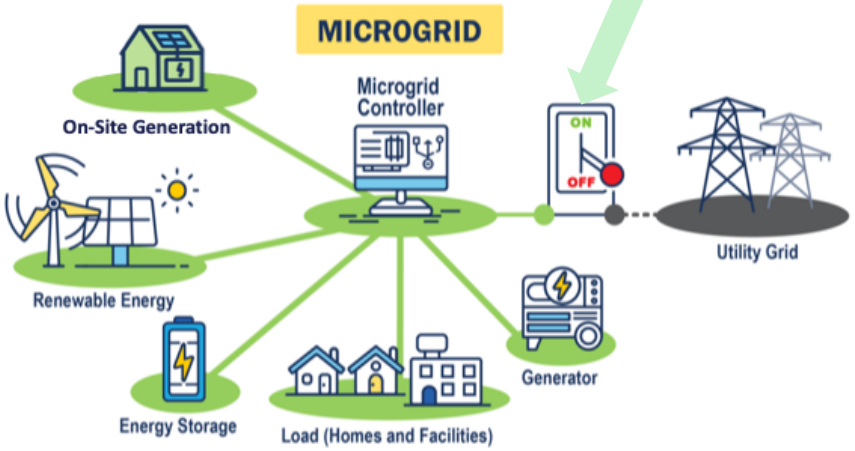
Per DOE:[1] A group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid.

Hawai'i Statute, through Act 200 (2018), has a more specific, but similar, definition for microgrids.[2]

Hawaiian Electric's Microgrid Service Tariff:

1. **Customer microgrid** where a customer's infrastructure is exclusively used to supply all their own electricity needs during emergencies (*most common for residential and small commercial situations*).
2. **Hybrid microgrid** in which an operator may combine utility infrastructure and customer infrastructure to supply electricity to microgrid members during an emergency.

A "**grid-connected**" microgrid is connected to the main utility grid during typical operations and "**islands**" when the main grid is down.

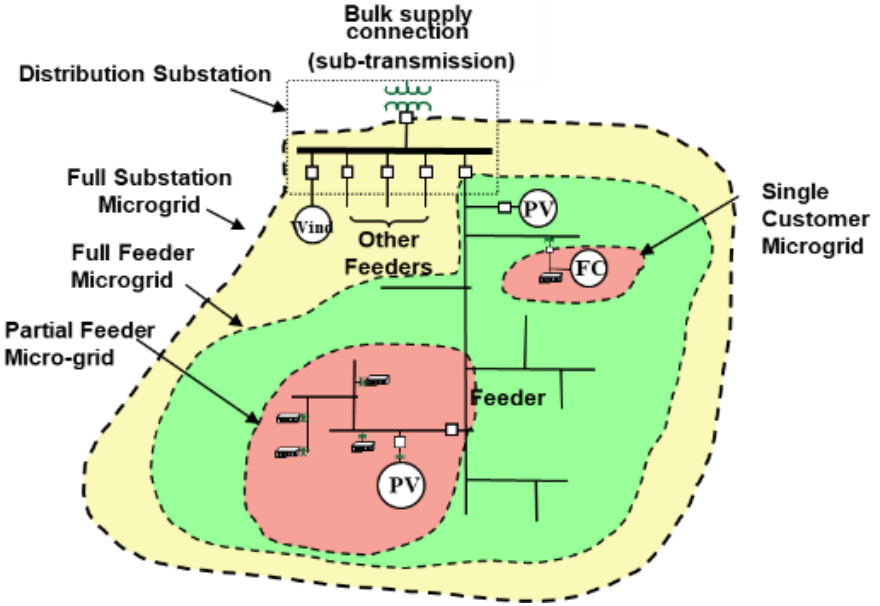


Features of an example microgrid.
Graphic adapted from U.S. DOE.

[1] DOE Grid Deployment Office. 2024. "Microgrid Overview." https://www.energy.gov/sites/default/files/2024-02/46060_DOE_GDO_Microgrid_Overview_Fact_Sheet_RELEASE_508.pdf.
[2] Hawaii Revised Statutes § 269-46 (c)(2024).

Microgrids Can Be of Different Scales

- Microgrids can be applied at many different scales to provide improved resilience across an energy network.
- Different scales involve "islanding" increasingly large portions of the electric grid.
- Energy generation and/or storage are needed for a microgrid at any scale.



Example of various scales of microgrids on a distribution network.
Graphic from Kroposki, Ben. 2007. "America's Energy Future: Panel on Electric Power Generation from Renewable Energy Sources." National Academies.

Examples of Microgrids at Different Scales

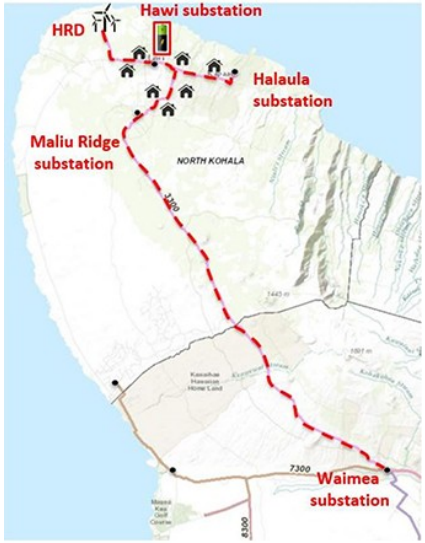
Individual facility

Example: a home, church, or business serving as a local resilience hub

Note: This may not be considered a microgrid by DOE or the state but is considered a "customer microgrid" by Hawaiian Electric.

Collection of buildings

Example: A shopping center, campus, or neighborhood



An entire town, district, or subregion

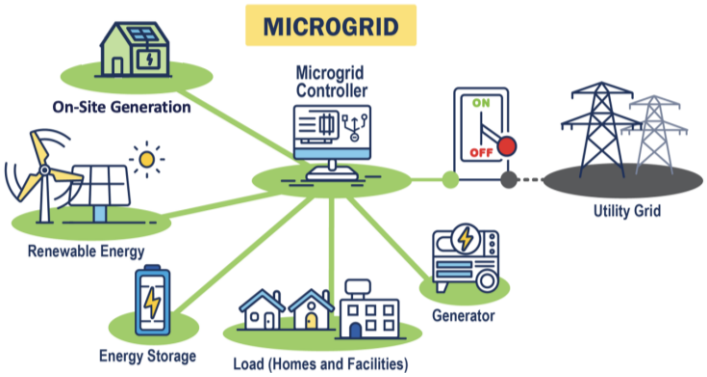
Example: North Kohala; Borrego Springs, CA*

**Note: This project is re-evaluating options.*

Graphics sources: Left adapted from DOE; middle from DOE's Hit Me with Your SunShot photo contest, https://www.flickr.com/photos/departmentofenergy/36293688136/in/album-72157684507661763; right courtesy of Hawaiian Electric, "North Kohala Microgrid," https://www.hawaiianelectric.com/about-us/our-vision-and-commitment/investing-in-the-future/north-kohala-microgrid.

Task 3. Microgrids – Overview

NLR Task Leads:
Amanda Farthing
Ian Baring-Gould



Features of an example microgrid.

Adapted from DOE[1]

Activities: Develop preliminary microgrid designs and assess costs and benefits and implementation considerations for select use cases and projects.

Key audiences: Lahaina community, developers/planners, Hawaiian Electric, the Hawai‘i State Energy Office (HSEO), the public utilities commission (PUC).

Pathway to implementation:

- High-level energy planning informed by costs and benefits of microgrids at varying scales.
- Inform plans for specific microgrid projects (pursuing funding/financing, developing requests for proposals).
- Provide information to support near-term development needs.
- Identify policy, regulatory, and business model challenges and consider potential alternatives.

[1] DOE Grid Deployment Office. 2024. “Microgrid Overview.” https://www.energy.gov/sites/default/files/2024-02/46060_DOE_GDO_Microgrid_Overview_Fact_Sheet_RELEASE_508.pdf.

Task 3. Microgrids – Subtasks and Timeline

Subtask	High-Level Timeline*
3.1: Policy and regulatory review, community mapping, and information gathering (closely connected to Task 5)	Months 1–4
3.2: High-level (bracketing) microgrid analyses	Months 2–8
3.3: Detailed microgrid analyses	Months 6–13
3.4: Implementation considerations and microgrid development TA	Months 10–17

*Project is in month 5 at the time of this presentation.

Prioritizing Microgrids

In this workshop:

Discuss where you prefer to access services during an emergency.

Prioritizing Microgrids

In the next community workshop:

- NLR will share estimated costs and benefits of several microgrid options.
- You will provide input for down-selecting to two microgrid options for detailed analysis.

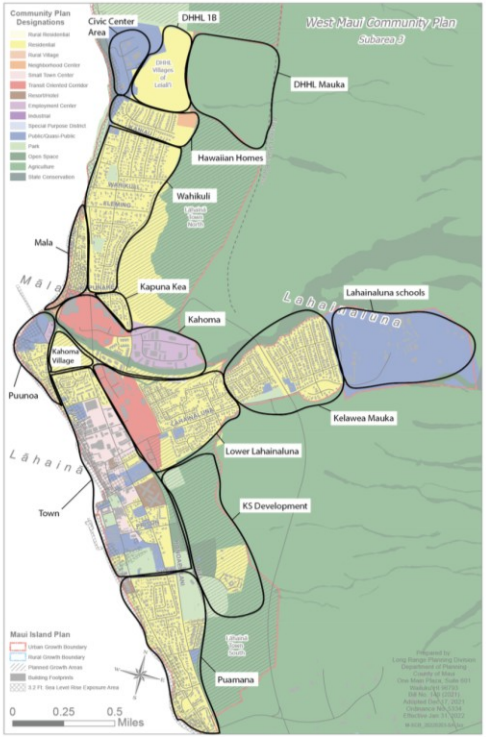
Costs and Benefits of Microgrids

Estimate the costs and benefits for microgrids at differing scales:

- Typical home[1]
- Each neighborhood
- Critical service clusters (e.g., Civic Center, Gateway and Cannery Mall)
- Lahaina
- West Maui[2].

Cost and benefit metrics:

- System sizes (MW)
- Up-front cost ($) and cost of electricity ($/kWh)
- Cost of designing to increasing outage durations (4 h, 12 h, 48 h)
- Resilience benefits (percentage of access to critical services during outage).



Neighborhoods identified in the 2025 *Community-identified Energy Pathways Report*

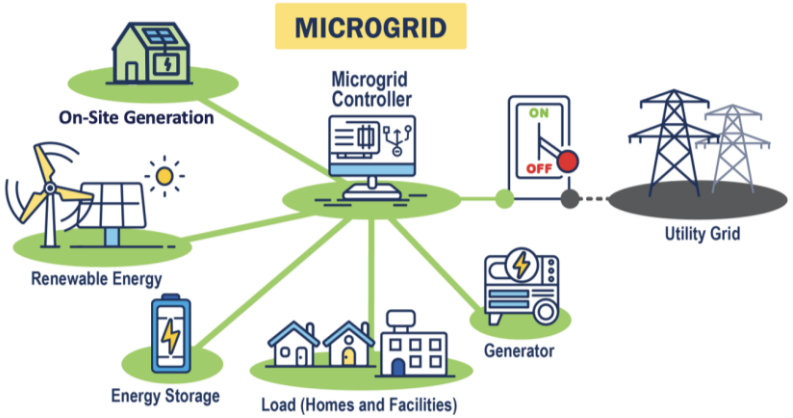
[1] Note a microgrid at a single facility is considered a "customer microgrid" per Hawaiian Electric's Microgrid Service Tariff.
[2] In this analysis, West Maui is considered as the areas within West Maui subject to Public Safety Power Shutoffs.

Source: Lāhainā Strong, Hā Sustainability, and Shake Energy Collaborative (2025), "Community-identified Energy Pathways Report," https://wearelahainastrong.org/wp-content/uploads/2025/10/Community-Facing-Community-Identified-Energy-Pathways-Priorities-Report_LEP-1.pdf.

Initial Resilience Assessment

How do we measure the costs and benefits of a microgrid?

Costs	Benefits
Installation ($)	Excess electricity sold to the grid ($)
Operations ($)	Cheaper electricity generated on-site ($)
Maintenance ($)	Services available during a power outage



Features of an example microgrid.

Adapted from DOE[1]

[1] DOE Grid Deployment Office. 2024.

Initial Resilience Assessment

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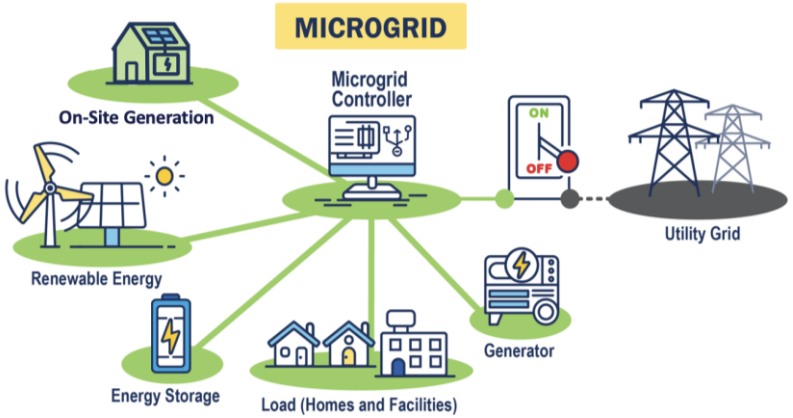
Critical Service Access



Features of an example microgrid.

Adapted from DOE[1]

[1] DOE Grid Deployment Office. 2024.

What Services Do People Need?

Provisions

- Obtain food and water
- Cook food
- Store food
- Obtain fuel
- Obtain over-the-counter medications.

Health

- Obtain prescription medication
- Store medication
- Receive medical care
- Operate medical device.

Shelter

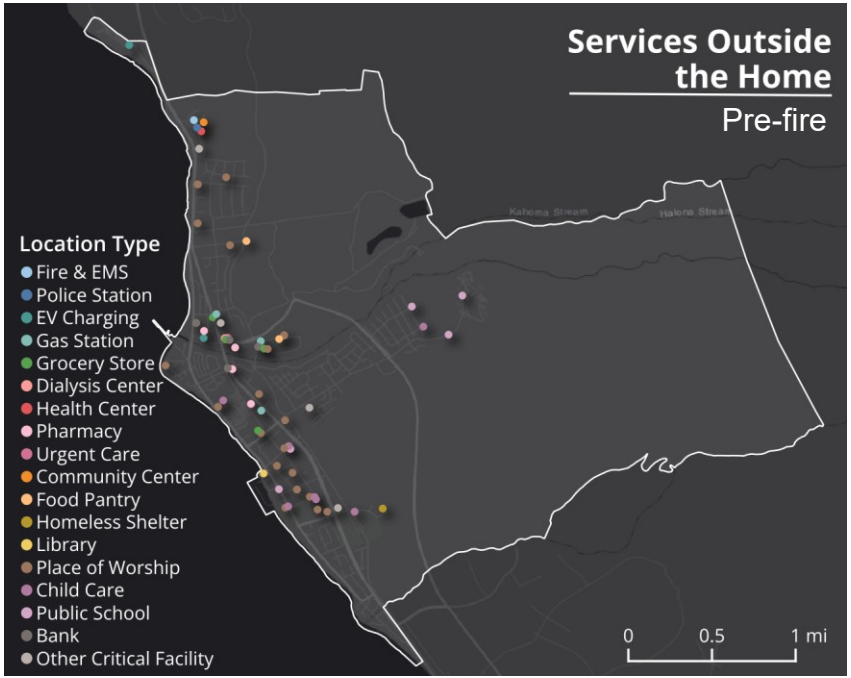
- Thermal regulation
- Hygiene
- Communication.

Misc.

- Public safety
- Childcare
- Banking.

Where Do People Access Services?

Map shows high-criticality locations across ~17 categories from public data sources (pre-fire). Table shows locations that are near many households and might provide service in one or more categories.



Potentially Key Locations	Service Categories
Children of the Rainbow Preschool	Child Care
CVS ●	Provisions, Health
Holy Innocents Preschool	Child Care
Kamehameha Elementary	Provisions, Health, Shelter
Ke Kula Kamali'i Pu'uwai La'a Child Care	Child Care
Lahaina Fire Department ●	Health, Public Safety
Lahaina Intermediate	Provisions, Health, Shelter
Lahaina Police ●	Public Safety
Lahaina United Methodist Church	Provisions, Health, Shelter
Maria Lanakila Catholic Church	Provisions, Health, Shelter
Princess Nahienaena Elementary	Provisions, Health, Shelter
Office of Recovery ●	Public Safety
Punana Leo O Lahaina Child Care	Child Care
Safeway ●	Provisions
Shell ●	Provisions
Texaco	Provisions
Waiola Church	Provisions, Health, Shelter

Map by Maya Fein-Cole, NLR

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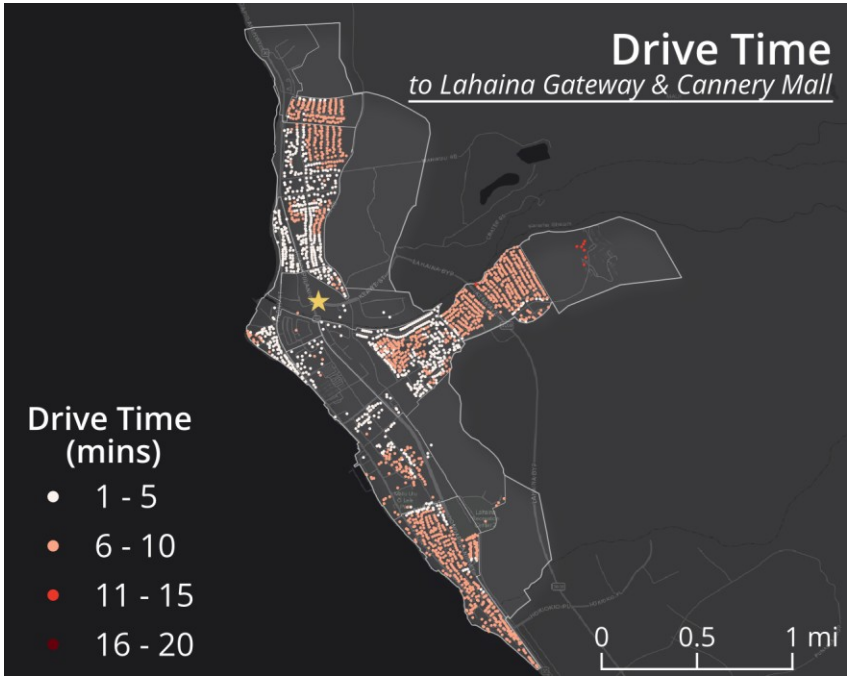
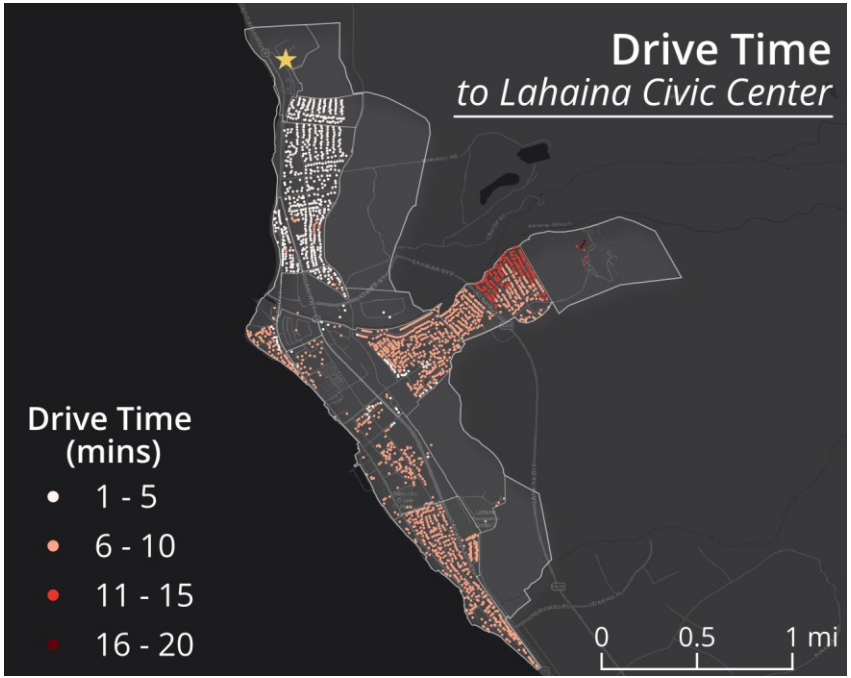
● Lahaina Gateway and Cannery Mall Example Microgrid
● Lahaina Civic Center Example Microgrid

Drive Time to Example Service Hubs*

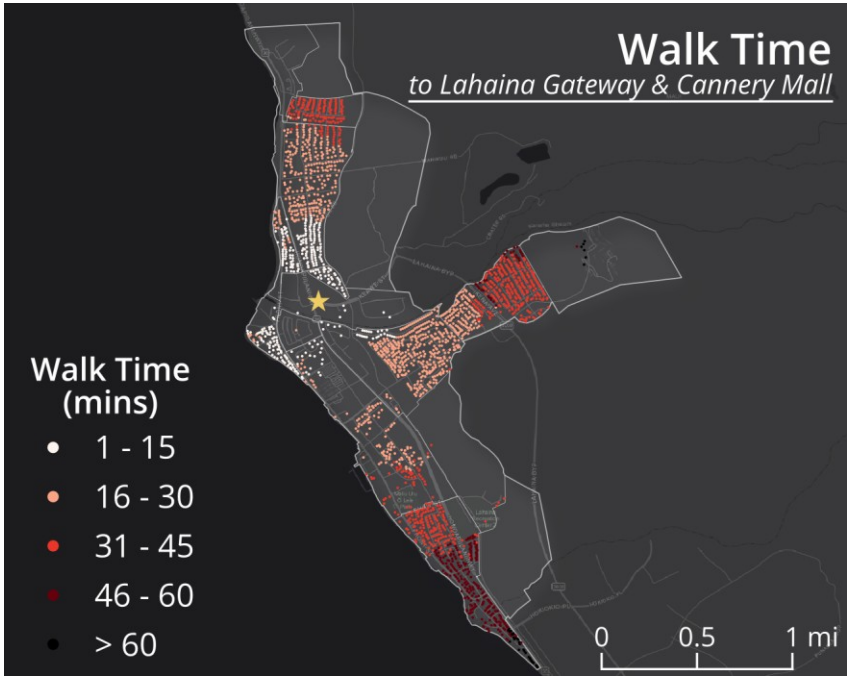


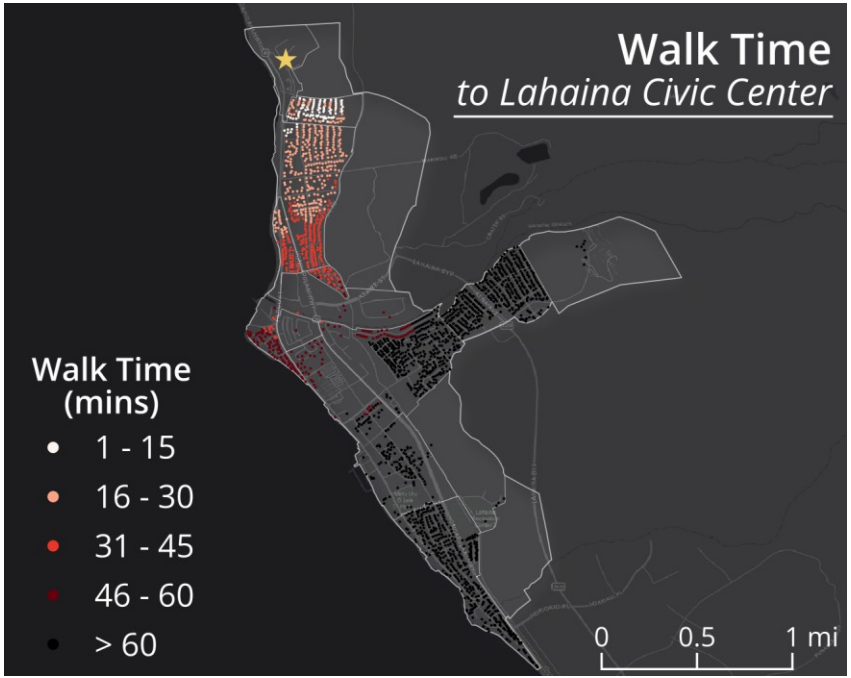


Maps by Maya Fein-Cole, NLR

*Example locations selected as part of Hawaiian Electric Critical Customer Hub grant proposals based on County-based and community service hubs identified and established in these locations immediately after the 2023 wildfires due to first responder agency services, groceries, pharmacies.

Walk Time to Example Service Hubs*





Maps by Maya Fein-Cole, NLR

*Example locations selected as part of Hawaiian Electric Critical Customer Hub grant proposals based on County-based and community service hubs identified and established in these locations immediately after the 2023 wildfires due to first responder agency services, groceries, pharmacies.

General Q&A

Discussion Questions Preview

- Which critical services locations (on slide 22) are less important? Which locations are missing?
- Besides the Lahaina Gateway and Cannery Mall and the Lahaina Civic Center, are there other “clusters” of critical facilities in Lahaina that would be high priority to keep powered during a major grid outage?
- Where would you go to access services if your first choice was unavailable?
- How much time should people have to spend traveling for different services in an emergency? Is it worth building more or larger microgrids to travel less?

Task 4. Distribution Grid/ Undergrounding

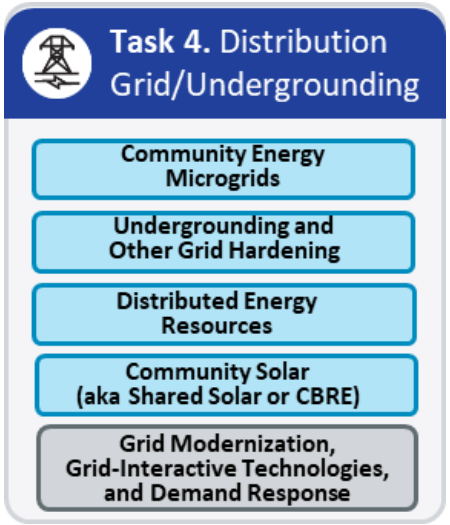
Presented by Bryan Palmintier, NLR

Leads: Manasa Muralidharan (acting) and Lawryn Kiboma, NLR

Photo by Robin Burton, NLR

Task 4. Distribution Grid/Undergrounding – Overview

NLR Task Leads:
Manasa Muralidharan
Lawryn Kiboma
Bryan Palmintier



Activities: Support Lahaina community and utility stakeholders with information to understand and make grid-informed decisions on grid hardening and microgrid opportunities.

Key audiences: Community, utility partners (Hawaiian Electric), Hawaii Public Utilities Commission (PUC), Hawaii State Energy Office, and County of Maui.

Pathway to implementation: Support grid investment decision-making in coordination with Hawaiian Electric.

Task 4. Distribution Grid Goals

- Support enhanced community understanding of trade-offs and opportunities for undergrounding and other grid hardening approaches.
- Coordinate with Hawaiian Electric.
- Assess what would it take (technically) to enhance microgrid benefits.
    - Grid configurations for microgrid scales
    - With microgrids task (Task 3):
        - Could resilience hub resources also support neighboring areas?
        - How might other distributed energy resources (e.g., rooftop solar and batteries) help?
        - Can these boundaries be dynamic?
        - What about all of Lahaina? West Maui?

Photo by Robin Burton, NLR

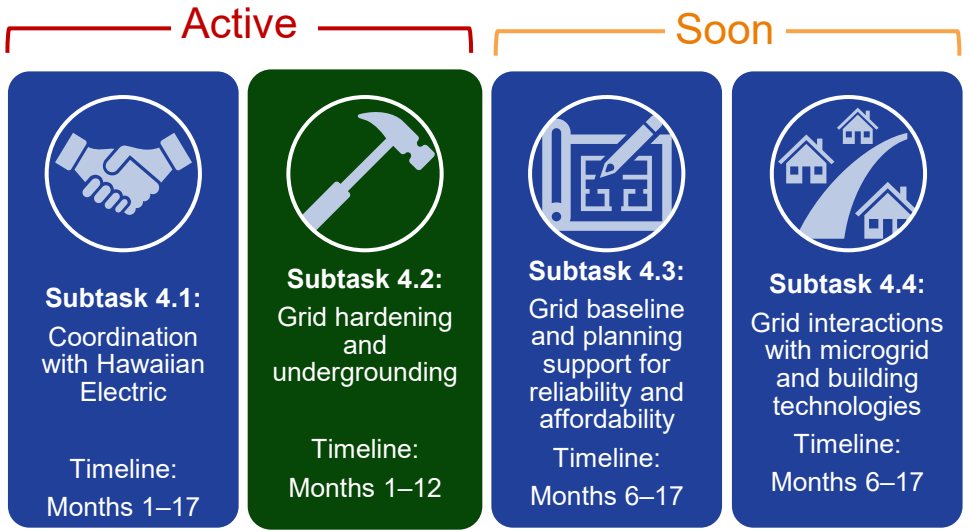
Task 4. Distribution Grid – Update and Timeline

Latest Activities

- Ongoing coordination with Hawaiian Electric including around data availability and avoiding duplication. (4.1)
- Working with local partners and other NLR task teams to identify high-impact analyses. (4.1-4.3)
- Reviewed Hawaiian Electric's Wildfire Safety Strategy and other sources to compare approaches (presented in the following slides, 4.2).

Today's Objectives

- Review background on grid hardening approaches for community awareness (Subtask 4.2).
- Introduce grid considerations for different microgrid options (4.3/4.4).
- Solicit input on impactful grid analytic support (4.3/4.4).



Project is in month 5 at time of this presentation.

Hazard Management Is More Than Just Physical Hardening

Strategic combinations provide the best defense against all hazards, wildfire and beyond

GRID HARDENING

- Undergrounding and partial burial
- Covered conductor
- Pole replacement and strengthening
- Line rerouting, redundancy, or removal
- Substation hardening
- Hazard-resilient equipment replacement
- Circuit sectionalizing

SITUATIONAL AWARENESS

- Localized weather stations
- Monitoring cameras, including Artificial intelligence (AI)
- Real-time fault detection
- Enhanced sensing (e.g., AMI, SCADA)
- Temperature, vibration, and corona detection sensors
- Real-time command center

PREVENTION

- Vegetation management
- Vegetation mapping
- Aerial and infrared (IR) inspection
- Increased inspection
- Pole testing and inventorying
- Animal guard devices
- Arc suppression and prevention technologies

OPERATIONAL

- Public safety power shutoffs (PSPS)
- Suspend auto-reclose settings
- Adaptive protection
- Microgrid islanding
- Pre-positioning of equipment and crews
- Critical customer hubs (CCHs)
- Dynamic line thermal rating

PROGRAMS AND POLICY

- Customer resiliency programs
- Innovative funding and financing for hardening
- Hazard mitigation investment recovery mechanisms
- Integrated grid planning for multiple hazards
- Performance-based regulation tied to reliability/ resiliency metrics

COMMUNICATION

- Pre-event coordination with emergency responders
- PSPS customer communications
- Public outreach and coordination
- Multi-platform communications (e.g., text, app, phone, radio)
- Educational campaigns

ANALYTICS

- Predictive risk scoring
- Risk mapping
- AI and machine learning for hazard prediction and detection
- Infrastructure fragility models
- Probabilistic risk assessment

References: Hawaiian Electric (2025–2027 Wildfire Safety Strategy), Panteli et al. (2017), PG&E and SCE Wildfire Mitigation Plans, National Academies: Enhancing the Resilience of the Nation's Electricity System.

Wildfire Mitigation Comparison

Hardening extends beyond undergrounding, presenting trade-offs and synergy opportunities

Graphic courtesy of Hawaiian Electric

Stakeholder and Community Partnerships

Grid Hardening and Redesign

Situational Awareness

Operational Practices

	Undergrounding	Covered Conductor	Fire-Resistant Equipment	Situational Awareness	System Operation	Vegetation Management	PSPS
Risk Reduction[1]	90%–99%	60%–90%	10%–30%	20%–60%	30%–70%	40%–60%	99+%
Cost	$$$$[2]	$$	$$	$$	$	$	Up-front: $ Ongoing: $$$
Timeline	Slow	Medium	Medium	Fast	Fast	Fast	Fast

[1] Percentages show risk reduction for each measure independently; however, the best strategies combine multiple approaches

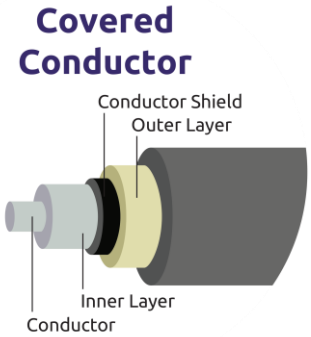
[2] Undergrounding costs can be significantly lowered if done in conjunction with other in-ground work (e.g., road construction) and vary widely with soil type and cultural considerations.

Sources: TRC Companies (Hardening vs. Hiding, 2025); Hawaiian Electric (2025–2027 Wildfire Safety Strategy); SCE (Targeted Undergrounding in High Fire Risk Areas Fact Sheet, 2025).

Example of Covered Conductors

Covered conductors can prevent ignitions if lines touch trees or the ground.

- Three to nine times less expensive than undergrounding.
- Benefits: Minimal ignition risk from tree/ground contact. prevents wire damage, wildlife-friendly, improved reliability, reduced maintenance, longer lifespan, minimal impact to buried cultural items, faster install and repairs.
- Challenges: downed lines may prevent evacuation unless set back, vulnerable to wind and collision, more visible.



Replacing bare wire with protective layer conductors to prevent ignition from trees falling on lines or clashes during windy conditions. *Graphics courtesy of Hawaiian Electric, https://www.hawaiianelectric.com/safety-and-outages/wildfire-safety.*

	Covered Cable	Underground
Risk reduction[1]	60%–90%	90%+
Cost per mile[2]	$1.2–$1.8 M	$6–$11 M
Time to build[3]	2 years	2–4+ years

If Lahaina has ~60 miles of lines, this works out to ~$72 million–$108 million for covered cable and ~$360 million–$660 million for underground.

[1] TRC Companies (Hardening vs. Hiding, 2025)
[2] Hawaiian Electric (2025–2027 Wildfire Safety Strategy)
[3] SCE (Targeted Undergrounding in High Fire Risk Areas Fact Sheet, 2025)

In Case You Missed These: Initial Insights From Discussions With Hawaiian Electric

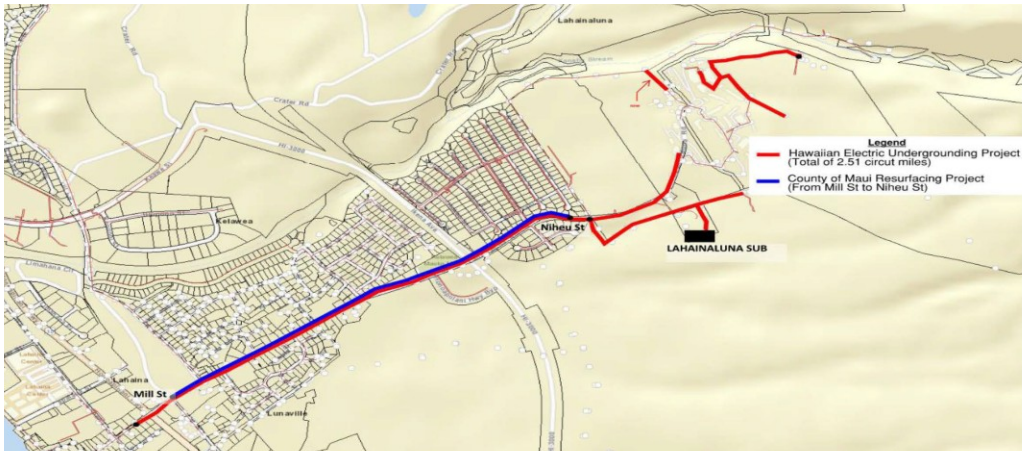
Hawaiian Electric is moving forward with undergrounding 3+ miles on Lahainaluna Road to mitigate the highest ignition risk, in coordination Maui County road widening. The county is also looking at undergrounding along Front Street.*

- Timeline depends on county's plans and roadwork schedule.
- Aligning with ongoing road improvement work allows lower construction costs and more miles to be undergrounded.
- Engaged community working group and presented at the in-person Lahaina Community Meeting in September 2025

Hawaiian Electric and Maui County have more undergrounding plans in the pipeline.

- Potential for additional community input.

Access Hawaiian Electric's presentation at the Lahaina Community Meeting in September 2025 →



Graphic courtesy of Hawaiian Electric, from presentation at County of Maui's Lahaina Community Update Meeting on Sept 3, 2025, https://intercom.help/mauirecovers/en/articles/12134010-lahaina-community-meeting-on-september-3-2025.

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*Hawai'i News Now (Sept 30, 2025), https://www.hawaiinewsnow.com/2025/10/01/maui-county-unveils-draft-designs-lahainas-commercial-district/

Grid Analyses by Microgrid Scale (Subtasks 4.3/4.4)

Depending on scale selected for microgrid analysis (Task 3) in consultation with community:

- Can existing or additional switches enable flexible microgrid sizes, such as to support additional nearby customers? (Neighborhood or hub scale).
- How could distributed energy resources, particularly storage, be sited to support both microgrids and routine grid needs? (Neighborhood, Lahaina town, or West Maui scale).
  - Could grid/upgrade cost savings help offset purchase costs?
- How might storage in Lahaina support “islanding” all of West Maui during PSPS and emergencies? (West Maui scale).
- What are best practice considerations and requirements for microgrid controls and configurations? (All scales).

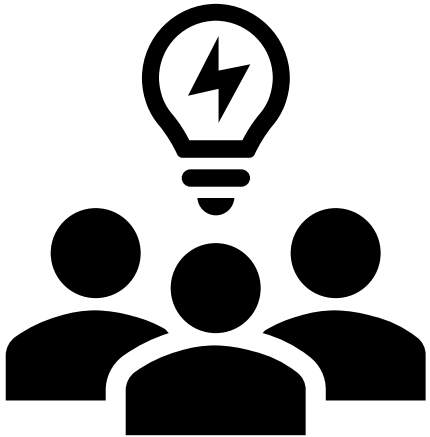
General Q&A

Discussion Questions Preview

1. Based on our presentations today, which **microgrid scales** are you most interested in learning more about:
   single site, neighborhood, critical service cluster*, Lahaina town, all of West Maui?
   - Just looking for first impressions; we'll ask again in the spring along with microgrid bracketing analysis results.

2. In addition to the **undergrounding** planned for Lahainaluna Road and Front Street, what **other areas** of Lahaina town would you like Maui County and Hawaiian Electric to consider with any additional recovery funding that may be available?

3. What **other** kinds of **grid analysis** support would be valuable?



*e.g., Civic Center, Gateway and Cannery Mall

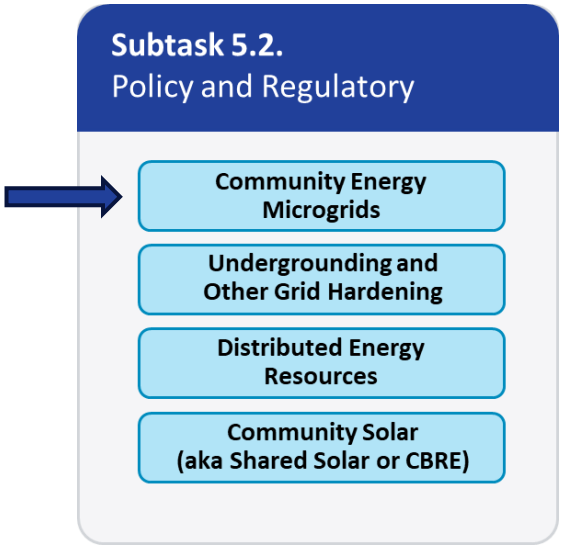
Task 5. Crosscutting Topics

Provide **crosscutting insights** to strengthen and align with Tasks 1–4:

- **Subtask 5.1. Workforce Development and Job Training**
- **Subtask 5.2. Policy and Regulatory Analysis**
- **Subtask 5.3. Funding and Financing.**

Subtask 5.2. Policy and Regulatory Analysis – Overview

NLR Task Lead:
Taylor L. Curtis, Esq.



Activities:

- Research existing policies and regulations (federal, state, local, utility) associated with community and hybrid microgrid models, developing identified energy solutions (e.g., rooftop and community solar, low-impact hydropower, microgrids, community ownership models).
- Research implementation opportunities and challenges for identified energy solutions.
- Summarize findings in a final memo.

Key audiences: Lahaina community, developers/planners, Hawaiian Electric, and HSEO.

Pathway to implementation: Use results to inform energy planning efforts with existing laws and regulations and identify implementation opportunities and/or challenges.

Microgrid Policy Landscape

Identified and analyzed: Hawai'i statutes, regulations, PUC dockets, Hawaiian Electric tariff, interconnection requirements, wildfire/PSPS rules, and county plans.

Goal: Not to capture everything, but to identify key constraints and opportunities that directly affect microgrid feasibility in Lahaina.

June 12, 2025 - In the rural community of Castañer, Lares, a small market building stands with solar panels mounted on its rooftop. This setup is part of a community microgrid project that provides renewable electricity to local residents. *Photo by Glorynel Ojeda Matos, NLR*

The policy landscape sets the rules for how Lahaina can design, own, and operate future microgrids.

[⚖️ Laws] → [📑 PUC Tariff] → [🔌 Interconnection] → [🔥 Wildfire/County Plans] → [⚡ Microgrid Pathways]

What the Microgrid Services Tariff Allows Today

- Customer microgrids (single site) and small hybrid microgrids (≤ 1 MW) (*but hybrid applications currently closed*) can interconnect and island during emergencies.
- These models work well for resilience hubs, schools, clinics, cultural centers, and clustered rebuild parcels.
- Other regulatory pathways exist for microgrid development outside the Microgrid Services Tariff.
- **Why it matters:** These configurations are supported under today's tariff and interconnection rules and can support critical community services and provide backup power during outages.

PV system with battery storage at a school in Colipar Abajo, Argentina. This system represents the type of microgrid configurations currently supported under the Microgrid Services Tariff. *Photo by NLR*

Today's Microgrid Services Tariff (Rule 30) supports small, site-focused microgrids that can power critical spaces during emergencies.

[⚡ Single-Site] → [🏘️ Small Hybrid Clusters] → [🧰 Emergency Islanding Only] → [💡 Near-Term Pilot Options]

Important Limitations in Today's Microgrid Tariff

What Is Not Eligible Under the Current Microgrid Tariff (Rule 30):

- Hybrid microgrids >1 MW
- Multisite or multicampus systems
- Utility-owned or utility-private partnership microgrids (*but possible via another regulatory pathway*)
- Systems that island during planned outages or PSPS (emergency-only islanding allowed).

What This Means for Lahaina:

- Many resident-prioritized models—neighborhood clusters, multisite resilience hubs, and larger hybrid microgrids—are not yet possible under today's Microgrid Services Tariff (Rule 30).
- Current rules support only small, single-site systems
- Community-scale designs will require policy updates.

Today's microgrid tariff excludes:

- Multisite and multibuilding community microgrids
- Systems above 1 MW
- Public-private partnership ownership models
- Microgrids intended for planned outage or PSPS islanding.

Upcoming policy changes will address valuing resilience, enabling multisite microgrids, compensation frameworks, and broader ownership options—critical for Lahaina's community-scale rebuild.

Current rules limit community-scale microgrids; only small configurations fit under today's tariff.

[🚫 Multisite] → [🚫 >1 MW] → [🚫 Utility Partnerships] → [🚫 Nonemergency Islanding] → Only small, single-site configurations qualify today

Act 266: Future Pathways for Community and County Microgrids

Allows:

- County, cooperative, and nonprofit entities to own and operate microgrids without being treated as public utilities.
- Renewable energy wheeling for projects between 100 kW and 2 MW.
- Creates legal basis for future multisite microgrids.

What Is Still Needed:

- PUC must finalize the wheeling tariff and any updates needed for Microgrid Services Tariff by January 1, 2027 (Docket 2024-0200).
- Rules on feeder eligibility, metering, settlement, and shared loads are not yet defined.
- Will need to align with forthcoming wheeling and PUC tariff updates required by Act 266.

Facilities, including resilience hubs and emergency shelters, up to 2 MW, could be linked through shared renewable-energy transfers enabled by Act 266, beginning as early as 2027 once the PUC establishes the wheeling tariff.

Act 266 opens the door for up to 2 MW county- and community-led multisite microgrids—once new tariff rules are created.

[🏛️ Public Ownership] → [🔁 Energy Sharing] → [🛠️ Pending PUC Rules] → [🌐 Multisite Microgrids]

Hawaiian Electric Operated Microgrid Model

What This Model Is:

- Hawaiian Electric owns and controls microgrid controllers and islanding switches but generation and storage may be owned by a third party
- Operations, maintenance, and islanding/reconnection are managed directly by the utility
- Planned *outside* of the Microgrid Services Tariff (not a Rule 30 project)
- Could allow larger than 2 MW projects

What This Means for Lahaina:

- Potential regulatory pathway model outside of Rule 30
- Could support larger, multisite or community-scale microgrids currently not allowed under Rule 30, if Hawaiian Electric leads development
- Would still require PUC approval and Hawaiian Electric willingness to treat Lahaina or West Maui as a utility-led resilience investment
- Could align with Act 266, including PUC work on intragovernmental wheeling and updated microgrid tariff rules.

North Kohala Microgrid Case Study:

- Identified in Hawaiian Electric's 2018 Integrated Grid Planning process as a priority resilience need
- Advanced through a PUC-reviewed utility procurement, not Rule 30
- Proposed and still pending.

Utility-operated microgrids offer an alternative pathway for community-scale and larger-scale designs.

[⚡ Utility Ownership] → [📍 Resilience Need Identified] → [📑 PUC Approval] → [🌐 Potential Lahaina Application]

What These Findings Mean for Lahaina

Today:

- **Customer microgrids (single-premise) and small hybrid microgrids (≤1 MW) are allowed** under Microgrid Services Tariff/Rule 30 (requires Rule 14H Interconnection Agreement + Microgrid Operator Agreement). However, hybrid microgrid applications under Rule 30 currently closed.
- **Community-scale/multisite systems up to 2MW:** Not enabled under today's Microgrid Services Tariff, BUT pathways expected as early as January 2027; depends on Rule 14H updates, Docket 2024-0200 (Track A wheeling & Track B shared crediting), and resilience hub policy (currently in progress)
- **Utility-operated models are possible** outside of Rule 30 with Hawaiian Electric proposal and PUC approval that could allow for larger microgrids (e.g., >2MW).
- **County/co-op/nonprofit ownership:** Allowed but constrained by Rule 30 limits and interconnection requirements.

Task 5.2: Will track these updates and coordinate with Task 3 on near-term and long-term options

Today's rules set the near-term options for Lahaina. Upcoming updates (Rule 14H, Docket 2024-0200, resilience hub policy) will determine what community-scale microgrids can look like long-term.

[📘 Current Rules] → [📍 Today's Options (Customer, Hybrid, Utility-Owned)] → [🛠 Rule 14H + Track A/B Updates] → [🌐 Future Community Microgrid Models]

Analysis Next Steps

- Identify technical limits (feeder constraints, multipremise metering, shared-load scenarios) and updates required by Act 266, and the wheeling docket (2024-0200) to expand operational flexibility.
- Assess feasibility of utility-operated microgrids (North Kohala model), including PUC approval and cost-recovery requirements for Lahaina pilots.
- Monitor PUC dockets and ongoing policy updates (e.g., Act 266, wheeling Docket 2024-0200, and Rule 14H interconnection rule updates).
- Evaluate ownerships models and how Rule 33 Bring Your Own Device+ (BYOD+), Smart Renewable Export, and Rule 14H export limits affect near-term pilot economics and ownership/business model options.
- Assess distributed energy resource eligibility where rules remain unclear (e.g., small/conduit hydropower, pumped storage hydropower, waste-to-energy) and coordinate findings with Tasks 1 and 3.

Battery incentives and rooftop solar programs may help support near-term microgrid pilots. NLR will evaluate which existing tariffs and programs best align with priority sites in Lahaina.

NLR will model how current programs can support near-term pilots while identifying updates needed under Act 266, and Rule 14H for future community-scale systems.

[🏠 Single Sites] → [🏘️ Small Hybrid Clusters] → [🧩 Tariff-Based Pathways (Rule 33/Smart Export/Rule 24)] → [⚡ Utility-Owned Microgrid Option] → [🛠️ Rule Updates] → [📊 Scenario Analysis]

General Q&A

Discussion Questions Preview

1. Which microgrid types or priority sites are most important for Lahaina right now under today's rules and constraints (customer microgrids, small hybrid clusters, or utility-operated option)?
2. What community-scale or multisite microgrid ideas would you like to see become possible through future rule or tariff updates–or through a utility-operated model like the North Kohala proposal?
3. What concerns or needs do you have related to interconnection, wildfire/PSPS requirements, utility coordination, or safe islanding/reconnection?
4. Which ownership or governance models (county, cooperative, nonprofit, community clusters, or utility-operated model) seem like the best fit for Lahaina's long-term resilience goals?
5. What do you want NLR to focus on in the next phase of microgrid regulatory and policy analysis?

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Small Group Discussions

Photo by Robin Burton, NLR

Small Group Discussions

Objectives

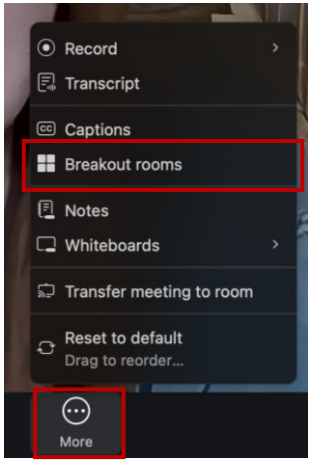
- Continue to learn more about the current status of each task.
- Ask your questions.
- Answer questions from NLR.

Instructions

- Three breakout rooms: one each for microgrids, distribution grid/undergrounding, and policy analysis.
- Go to rooms of tasks you are most interested in/want to know more about.
- Two rotations of 15 minutes each (30 minutes total).
- NLR task lead and local partner will facilitate each room and take notes.
- Answer questions verbally or in writing on a Mural board: https://bit.ly/4ili1FV.

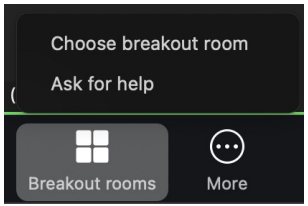
Join a Room

If you don't see a pop-up box, try navigating to "More" in the bottom right.



Change Rooms

Click "Breakout rooms" to navigate to a different room.



Next Steps

- NLR will continue to make progress on TA activities.
- NLR and partners will continue to engage with community and stakeholders with requests for information and present interim results and products.

Mahalo!

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Subtask 5.2 Appendix

Rule 14H: The Technical Interconnection Gatekeeper

What It Does:

- Sets inverter standards, safety rules, and export limits.
- Determines whether a site can safely interconnect.
- Required before enrolling in the Microgrid Tariff (Rule 30).

Why It Matters:

- Some West Maui circuits have limited hosting capacity.
- If a site can't interconnect, it cannot become a microgrid.
- Applies to all distributed energy resource technologies, including solar plus batteries.

Rule 14H = Interconnection Gatekeeper
Before a microgrid can apply under Rule 30, it must:

- Pass inverter and protection device requirements.
- Demonstrate safe export limitations.
- Fit within circuit hosting capacity.
- Complete utility interconnection review.

If a site cannot pass Rule 14H, it cannot become a microgrid, regardless of design.

Safe interconnection under Rule 14H is the first requirement for any Lahaina microgrid.

[Inverters] → [Protection Devices] → [Hosting Capacity] → [Rule 30 Eligibility]

Wildfire and PSPS Rules Affect Microgrid Operation

- Define when circuits must de-energize during high fire risk.
- Require sectionalizing and protection equipment for safe islanding.
- Govern when microgrids may reconnect after PSPS events.

Why It Matters:

- Wildfire protocols directly affect microgrid reliability.
- Hybrid microgrids must comply with safety and communication requirements.
- These rules are critical for wildfire prevention and grid safety and are some of the most important operational factors for microgrid design in West Maui.
- Because PSPS events are planned safety outages, they fall outside Rule 30's emergency-only islanding allowance—requiring future tariff updates to support safe, conditional islanding during high-risk fire conditions.

Wildfire mitigation and PSPS requirements define when circuits can remain energized and what protections microgrids must include—directly affecting islanding feasibility.

Wildfire safety rules influence when microgrids can island and how they reconnect after PSPS events.

[🔥 Fire Weather] → [⚠️ PSPS Protocols] → [🧲 Protective Devices] → [🟡 Conditional Islanding]

County Plans Identify Priority Microgrid Sites

The 2025 Hazard Mitigation Plan, Resilience Hub Network, and Lahaina Recovery Plan highlight critical facilities, community hubs, and civic buildings well-suited for microgrids.

Maui County's resilience hub network identifies key buildings where microgrids could support cooling, charging, communications, and emergency services.

Why This Matters: These sites align with Lahaina Energy Partnership community priorities and create clear pathways for early microgrid piloting and Federal Emergency Management Agency (FEMA) funding eligibility.

County resilience planning aligns with microgrid opportunities across Lahaina.

[🏠 Hubs] → [🚒 Critical Facilities] → [🏛️ Civic Buildings] → [📍 Priority Microgrid Sites]